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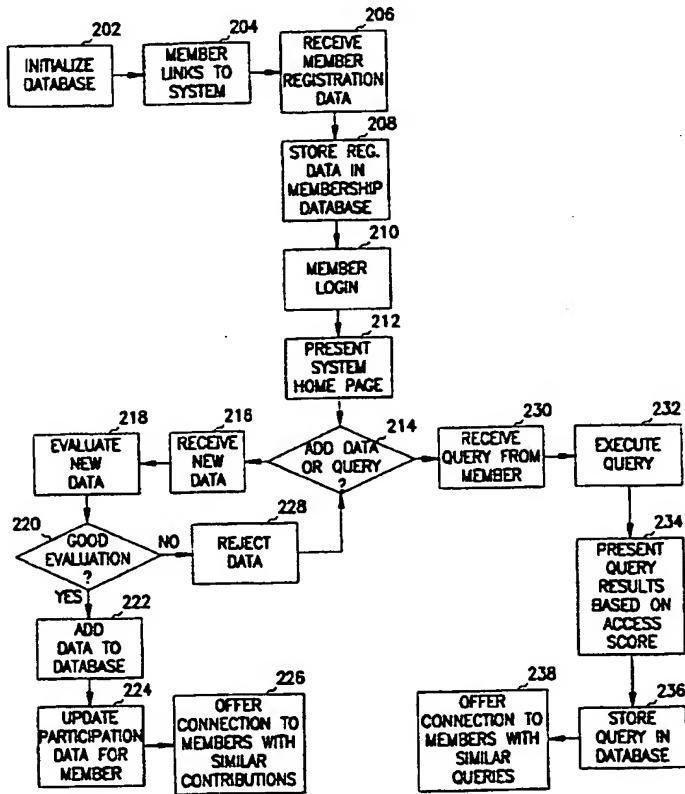
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[Continued on next page]

(54) Title: SYSTEMS, METHODS, AND SOFTWARE FOR BUILDING INTELLIGENT ON-LINE COMMUNITIES



(57) Abstract: In recent years, computers have become everyday communication tools, fast approaching the commonness of telephones and televisions. Driving this approach is rapid growth of the much-heralded Internet, which functions as a planetary communications system, enabling users to communicate with each other, to transmit data to each other, and to search for data of particular interest. Two problems stemming from the rapid Internet growth are the time and effort often necessary for users to find data of particular interest and the difficulty for users to find and communicate with other users who share interests in similar kinds of information. Accordingly, the present inventor devised systems, methods, and related software for encouraging and managing growth of databases, particularly theme oriented databases, such as health-in-information databases. One exemplary method entails establishing a theme-oriented database, receiving user contributions to the database, and granting users access rights to the database based on their contributions. The exemplary method also scores user contributions for quality and/or relevance to the theme of the database, and grants access rights based on the scores. Additionally, the exemplary method records the queries of users of the database and facilitates communications between users having similar queries.

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**SYSTEMS, METHODS, AND SOFTWARE FOR  
BUILDING INTELLIGENT ON-LINE COMMUNITIES**

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**Related Application**

The present application is a continuation of U.S. Provisional Application  
15 60/154,885 which was filed on September 20, 1999. This application is incorporated herein by reference.

**Background**

Computers have enjoyed, in recent years, an enormous growth in utility. Early computers allowed users to perform tasks such as word processing and  
20 bookkeeping. Today, however, computers have become everyday communication tools, fast approaching the commonness of telephones and televisions.

Much of this growth in the communications realm stems from the fantastic, compounded growth of computer networks, such as the much-heralded  
25 Internet ---a worldwide network of computers interconnected through public and private wiring and telephone systems. The Internet functions as a planetary communications system, enabling users to communicate with each other, to transmit data to each other, and to search for data of particular interest.

One problem stemming from the rapid growth of the Internet concerns  
30 the time and effort often necessary to find data of particular interest. There are numerous publicly accessible search engines that continually work to index the data on the Internet and thus facilitate locating it. However, with the vast amounts of available data, these search engines often answer user queries with large amounts of irrelevant data, leaving users to spend significant time and

effort sifting through it for the data, the knowledge, they actually want. Although combination search engines have been developed to allow users to simultaneously use two or more search engines, in many instances these have only presented users with even more data to sift, thus compounding the data-finding problem.

Another related problem is that the planetary scope of the Internet makes it difficult for users to find and communicate with other users who share interests in similar kinds of information. Websites, chat rooms, and forums devoted to particular topics, such as health, have emerged in recent years. However, the 10 information shared through these websites, chat rooms, and forums is too often sparse and of poor quality, since many participants behave as spectators and do not actively contribute information. Moreover, direct competition between the websites, chat rooms, and discussion forums for users generally leads to smaller, fragmented communities of users, thwarting development of larger aggregate 15 communities.

Accordingly, there is a need not only to reduce the time necessary to find particular types of data on the Internet, but also to facilitate development of communities of active users around specific topics and conversion of information into real knowledge.

20 **Summary**

To address this and other problems, the present inventor devised systems, methods, and related software for encouraging and managing growth of databases, particularly theme-oriented databases, such as health-information databases. One exemplary method entails establishing a theme-oriented database 25 and granting users access rights to the database based on their contributions or submissions to the database. One specific embodiment scores the contributions based on quantity, quality, and/or relevance, granting access rights based on the scores. Other embodiments record the queries of users of the database and facilitate communications between users having similar queries as well as users 30 making similar contributions.

Notably, various embodiments of the invention facilitate the incorporation of user experiential data into the context of thematic databases that

make it relevant and useful, in essence converting it to knowledge. In contrast, the vastness of the Internet stores such data in a vaccuum, rendering it impotent.

#### **Brief Description of Drawings**

5       Figure 1 is a block diagram of an exemplary theme-oriented database-management-and-community-building system 100 incorporating teachings of the present invention.

Figure 2 is a flow chart illustrating exemplary operation of system 100 in Figure 1.

10      Figure 3 is a block diagram of an exemplary home page 300 for use in system 100.

Figure 4 is a diagram of a list of categories linked to home page 300.

Figure 5 is a facsimile of another exemplary home page 400 for use in system 100.

15      Figure 6 is a block diagram of an exemplary intellegent medical information system which can be integrated into a medical- or health-oriented version of system 100.

#### **Detailed Description of Preferred Embodiments**

The following detailed description, which references and incorporates the 20 Figures, describes and illustrates one or more specific embodiments of the invention. These embodiments, offered not to limit but only to exemplify and teach, are shown and described in sufficient detail to enable those skilled in the art to implement or practice the invention. Thus, where appropriate to avoid obscuring the invention, the description may omit certain information known to 25 those of skill in the art.

#### Definitions

This description includes many terms with meanings derived from their usage in the art or from their use within the context of the description. As a further aid, the following exemplary definitions are presented.

30      The term "document" refers to any logical collection or arrangement of machine-readable data having a filename.

The term "database" includes any logical collection or arrangement of machine-readable documents.

The term "hyperlink" or "link" includes any token conforming literally or functionally to any past, present, or future Uniform Resource Locator (URL) standard. It also includes any token including information identifying a specific computer system or networked device.

5

#### Exemplary System Architecture

Figure 1 shows an exemplary theme-oriented database-management-and-community-building system 100. The broken lines in the figure indicate that various components of the system are interconnected permanently or temporarily via a wired or wireless wide-area-network, such as the Internet, or a secure wired 10 or wireless local-area networks, such as a corporate Intranet. The exemplary embodiment uses Secure Transaction Technology to ensure secure connections. System 100 includes user access stations 110, a web server system 120, a membership database 130, and a theme-oriented database 140.

More particularly, user access stations 110 includes one or more access 15 stations, of which stations 110a, 110b, and 110c are representative. The term "access station," as used herein, encompasses browser-equipped personal computers, network appliances, personal digital assistants, telephones, cell phones, web phones, televisions, web television, etc. Thus, the present invention is not limited to any particular class or form of access device.

20 Selectively coupled to access stations 110 is web server system 120. Web server system 120 includes one or more software modules 122 and one or more memory modules 124 which cooperate to serve data to and from databases 130 and 140 and the access stations 100, and to define and generate related webpages and graphical-user interfaces. (See, for example, exemplary home 25 pages 300 and 500 in Figures 3 and 5, respectively.)

Membership database 130 includes information regarding members or potential members (users) of system 100. Figure shows this information as representative records 132 and 134, which are substantially identical in structure.

In the exemplary embodiment, record 132 includes member-identification data 30 132a, member-profile data 132b, member-contact or -linking data 132c, and member-participation data 132d. Member-identification data 132a includes data for identifying or authenticating the identity of a user. Member-profile data 132b includes data describing the professional biographies and credentials of the

member. Member-contact data 132c includes data, such as one or more postal addresses, telephone numbers, e-mail addresses, or URLs for facilitating contact or communications with the associated user. And, member-system-participation data 132d includes quantitative and qualitative information regarding actual and 5 permitted use of the system by each user. For instance, the exemplary embodiment maintains one or more access scores for each member, indicating levels of access to respective portions of theme-oriented database 140.

Theme-oriented database 140 includes theme data 142, site data 144, query data 146, and user data 146. Theme data 142 includes one or more 10 keywords, terms, concept, or website address which define one or more aspects of the thematic or topical content of database 140. Exemplary themes or topics includes general healthcare and wellness information for humans or other animals, such as dogs, cats, or fish; specific healthcare information for various parts of the human body, such as joints (knees, hips, elbows, spine, etc.) or 15 organs (heart, lungs, stomach, kidney, liver, eyes, ears, skin, etc.); specific medical conditions, such as allergies (food, plant, etc.), cancer, arthritis, obesity, mental illness; auto-immune deficiency (HIV). Other exemplary topics include technology breakthroughs, health-technology breakthroughs, children, cooking, sports, entertainment, celebrities, politics, law, restaurants, consumer products, 20 motion pictures, videos, music recordings, corporations, government officials, criminal activity, schools, science, wines, beers, foods, professional service providers (lawyers, doctors, contractors, artisans. etc.) colleges, alumni of educational institutions, genealogy, gossip, or sex. One exemplary health-oriented database includes user-generated health content, medical-journal 25 content, and an archive of health-oriented feature stories. Thus, the present invention is not limited to any particular theme or class of themes.

Site data 144 includes feature articles, journal articles and other content added to database 144 manually by its creators, sponsors, or other parties governing or maintaining the database or automatically by the system itself.

30 Query data 146 includes a listing of one or more queries (or query summaries) made by registered users or members of the community, against the database, with each query associated with one or more portions of the membership data for its submitting member. User data 146 includes user contributions to the

database, with each contribution logically associated with or appended to one or more portions of the membership data for its submitting member.

In its exemplary operation, system 100 generally enables users not only to access, that is, query theme-oriented data in database 110, but also to 5 contribute data to the database. Users earn access rights to various portions of the database. Access rights are granted based on quality and/or relevance of database contributions and referrals of new members to the system.

#### Exemplary System Operation

More specifically, Figure 2, which shows an exemplary flowchart 200, 10 illustrates an exemplary method of operating system 100. Flow chart 200 includes blocks 202-230, which are executed serially in the exemplary embodiment. However, other embodiments of the invention may change the order of execution and/or execute two or more blocks in parallel using multiple processors or a single processor organized as two or more virtual machines or 15 subprocessors. Moreover, still other embodiments implement the blocks as two or more specific interconnected hardware modules with related control and data signals communicated between and through the modules. Thus, the exemplary process flow is applicable to software, firmware, and hardware implementations.

The exemplary method begins at block 202, with automatically or 20 manually establishing an initial version of theme-oriented database 140. To this end, the exemplary method entails determining a theme or topic and conducting one or more Internet searches to identify a set of one or more candidate members. Exemplary candidate members include existing websites or portions of websites related to the theme and persons or firms with expertise or indicated 25 interest in the theme. These website publishers of these publications and websites are then invited to register as members of the system. An exemplary electronic invitation includes an explanation of the system and a URL to the system. Execution of the exemplary method then proceeds to block 204.

In block 204, one or more of the candidate members establish a 30 communications link with the system through webserver 120. This entails each of the candidate members using an access station, such as access station 110, to invoke the URL to the system. For example, the user at access station 110 would invoke "www.domain-name.com" to connect her computer system (or

other network appliance) to webserver system 120. After establishing the link to webserver 120 execution proceeds to block 204.

Block 206 entails receiving registration information from the candidate member. The registration information includes member-identification data, 5 member-profile data, member-contact or -linking data, and member-system-participation data. Member-identification data includes data for identifying or authenticating the identity of a user, such as a username and password. Member-profile information includes professional biographical information, such as present employment, professional achievements, educational or other 10 promotional type material indicating or suggesting the authority or credibility of the registering member in the topic. Member-contact data includes data, such as one or more postal addresses, telephone numbers, e-mail addresses, or URLs for facilitating contact or communications with the associated user. Member-system-participation data includes an access score that governs the level of 15 access that the associated member has over theme-oriented database 140. The exemplary system determines an initial access score based on whether the user was referred by an existing member, or whether the user was given a special invitation based on his or her expertise in the theme. If an existing member referred the user, the access score for the existing member is increased upon 20 registration of the new user. After all registration information has been received for a particular member, execution proceeds to block 208

In block 208, the system records the received registration information in membership database 130. Although the exemplary embodiment maintains membership database 130 separate from theme-oriented database 140 for 25 heightened security, some embodiments combine the databases. With recording of the registration information, the exemplary method advances to block 210.

Block 210 entails the new member logging into the system to access theme-oriented database 140. Specifically, this entails the new (or an existing) member manually or automatically entering a username and password. (Existing 30 members bypass blocks 202-208 to reach block 210) The username and password are then verified against those in membership database 130. Affirmative verification advances the exemplary method to block 212.

In block 212, the system presents the member a home page for theme-oriented database 140. (See Figure 3 and related description of exemplary home page.) From the home page, the member decides to query database 140 or to contribute data to database 140 as indicated by decision block 214.

5 A member decision to make a contribution to the database branches execution to block 216, which entails receiving a contribution from the member. Execution then continues to block 218.

In block 218, the system evaluates or scores the contribution based on its quality and/or relevance to the theme-oriented content of database 140. To 10 evaluate the contribution, the exemplary embodiment converts the contribution to a natural-language query and executes this query against all or part of database 140. The natural-language searching algorithm produces quantitative measures of the relevance of the contribution. Other embodiments produce the measures using inverse-document-frequencies factors that favor rare terms and/or 15 frequency factors which favor terms that in the document to be scored. In some embodiments, the contribution is summarized using specialized software, such as that described in U.S. Patent 5,708,825, entitled Automatic Summary Page Creation and Hyperlink Generation, which is incorporated herein by reference. Other embodiments score the contribution based on additional factors, including 20 for example, length (number of words), number of citations to leading journals, inclusion of hyperlinks to predetermined cites (such as sponsors of the system) and/or grammar. Still other embodiments score the contributions manually using an editorial board of experts in the theme.

Execution then continues at decision block 220, where the system 25 determines if the evaluation was good or not. That is, is the contribution of sufficient relevance and quality to be added to database 140. If the contribution has a good evaluation, based for example on its score exceeding some threshold value, the system proceeds to block 222.

In block 222, the system adds the contribution to database 140. In the 30 exemplary embodiment, this entails appending the username along with one or more portions of the member's member-profile information and/or member-contact information to the beginning and/or end of the contribution. (Some embodiments use a side by side presentation approach for the contribution and

its attribution.) Thus, other members accessing this information can identify its contributing member and assess credibility and authority of the contribution.

Moreover, if a contributing member has elected to allow publication of its contact information, such as its e-mail address, future users of the information

5 may establish communications with the contributor. Publication of a hyperlink or URL associated with the contributor will offer opportunities for reciprocal web traffic from webserver 120 to a webserver associated with the contributing member, creating an incentive for further contributions to the theme-oriented database.

10 In block 224, after adding the contribution to database 140, the system updates the access score portion of the participation data for the member based on the score of the contribution. In the exemplary embodiment, this entails adding the score of the contribution to the initial or previous access score in membership database 130. However, other embodiments adopt other forms of  
15 update.

In block 226, the system offers the contributing member an opportunity to connect with one or more other members who have made similar contributions to database 140. In the exemplary embodiment, this entails defining a query based on the contribution and executing this query against the user data portion  
20 of database 140, more precisely user data 149. Based on the results of this query, the exemplary embodiment presents one or more usernames and related contact or biographical information for other members who have made similar contributions to the database, thereby facilitating communications between the contributing member and other contributing members.

25 On the other hand, if the contribution had a poor evaluation based on the threshold, execution proceeds to block 228 which outputs a message to the member indicating that the contribution was rejected. Some embodiments may offer an explanation for the rejection, and others refer the member to an alternate system with an appropriate theme for receiving the information. Still others  
30 reroute the contribution to the alternate system, automatically enrolling the member in the alternate system by transferring a copy of the associated membership information. After rejecting the data, execution returns to decision

block 214, where the member can choose to add new data or to submit a query for database 140.

From block 214, a decision to query database 140 branches execution to block 230, which entails receiving a query from the member. Although the 5 scope of the invention encompasses queries of any number of forms, the exemplary embodiment accepts queries as a textual string with boolean connectors or as a natural-language query. (Moreover, the exemplary embodiment permits the member to restrict the query to specific portions of theme-oriented database 140, such as to site data or user data.) Execution of the 10 exemplary method then proceeds to block 232.

In block 232, the system executes the query against database 140. In the exemplary embodiment, this entails running the query against the entirety of database 140. However, some embodiments restrict the query to one or more portion of database 140.

15 In block 234, the system presents query results to webserver 120 for viewing by the member through an access station. The exemplary embodiment presents the query results based not only on the query and the contents of database 140, but also on the access score for the member. Thus, for example, a low access score may result in all or a portion of the results being withheld from 20 the member. Some embodiments advise the member quantitatively regarding the withheld portion of the results. For example, the system presents a message that a certain percentage of the results is withheld. Other embodiments present citations for the portions being withheld to assist the member in determining the desirability of this withheld information. Variations of this approach may 25 present the profile of the contributors of the withheld results.

In presenting the results to the requesting member, the exemplary system arranges or organizes the results based not only on relevance to the query presented but also on factors, such as the access rights of the respective contributors of data the system. Thus, for example, data contributions from 30 contributors that have accrued relatively high access rights are generally presented before data contributions from contributors with relatively lower access rights, assuming the contribution are of approximately equal relevance to

the query. This presentation mechanism further encourages members, particularly those with related websites, to contribute content to the database.

Some embodiments present the results in a predetermined order based on the portions of the database that contain them. For example, one embodiment 5 presents found data in the order of feature articles, user contributions, and journal articles, with the items in each category arranged based on relevance and/or access rights of respective contributors.

In block 236, the system stores the query and associated member-profile and/or member-contact information to the query portion of database 140. Once 10 stored in database 140, the query is searched like any other content within the database. When query results include one or more queries the queries are presented along with the usernames associated with the queries.

In block 238, after storing the query, the system offers the contributing member an opportunity to connect with one or more other members who have 15 made similar queries of database 140. In the exemplary embodiment, this entails defining a query based on the query and executing this query against the query data portion of database 140, more precisely user data 146. Based on the results of this query, the exemplary embodiment presents one or more usernames and related contact or biographical information for other members who have made 20 similar contributions to the database, thereby facilitating communications between the member and other members with similar queries. Of course, the member than has the option to contact one or more of the other members. Other embodiments also presents the member options to connect with members who have published information relating to the query or to allow other members with 25 similar questions to contact her in the future.

#### Exemplary Home Pages

Figure 3 shows an exemplary home (or start) page 300 generated by webserver system 120 for display in response to authorized access to health-oriented version of database 140. Home page 300 includes banner advertising 30 regions 310 and 312, a site logo region 314, information region 316, a search region 318, a feature-content region 320, a sponsorship or partnership region 322, and link region 324.

Information region 316 includes a link 316a to a list of 120 links to categories of medical conditions and health areas. This list of links is shown in Figure 4 as table 400. Each category link takes the user to archive content, user-contributed content, relevant site-generated top-ten lists, and links or phone number for groups, hospitals and doctors that specialize in the condition. Some embodiments allow users to restrict the information based on geography.)

5 Information region 316 also includes a donor or contribution subregion 316b where users have the opportunity to publish useful health and medical information, and a site top-ten region 316c where users cast votes on their favorite products, services, and advice.

10

Search region 318 accepts entry of keyword or natural-language style queries. Submitted queries are executed against user-generated content, medical journal content, and site-created editorial content in database 140. In embodiments that associate, health-oriented database 140 with other theme-oriented databases, such as a knee database, a veins database, and a medical-technology database, search region 318 enables users to search across all or a subset of the related databases.

Feature-content region 320, in the exemplary embodiment, changes daily and includes health-related stories, of for example 600 words. This region 20 presents users an opportunity to add comments and/or contribute information at the end of the story in a user subregion 320a, below the story. User subregion 320a includes prompts (not shown) urging users to submit story-relevant information about local support groups and hospitals in their areas.

Sponsorship or partnership region 322 includes links to one or more 25 nationally-recognized e-commerce or pharmaceutical companies. Exemplary commerce partners include an on-line drugstore, a baby-and-children products store, an online book retailer, and a vitamins-nutraceutical store.

Link region 324 includes one or more links to other general health or 30 medical sites. Exemplary sites include a site for first-aid information and government health sites.

Figure 5 shows another exemplary home page 500. Home page 500 includes many features analogous to those in home page 300.

Exemplary Medical-Information System

Figure 6 shows an exemplary medical-information system 600 which can be integrated into system 100 of Figure 1, as software, hardware, or firmware modules. System 600 includes a user-registration-and-tracking module 602, an 5 initial-symptom-and-medical-history-dialog module 604, a condition-inference engine 606, a condition-hyperlink generator 608, a followup-dialog module 610, a knowledge-base-feedback module 612, and a user-comments module 614.

User-registration-and-tracking module 602 receives user or member registration or membership information and assigns the username and password. 10 Alternatively, the user can define her own username and password. Exemplary registration or membership information includes the gender and date of birth of the user. The registration information is stored in a database such as database 130 in system 100. The registration data is available for retrieval during subsequent user visits and for other operations of system 600, such as knowledge 15 base enhancement.

Initial-symptom-and-medical-history-dialog module 604 assigns a case number, specific to the username as it begins receiving an initial description of symptoms through a natural-language interface. A parser (not shown) attempts to extract one or more symptoms from the initial description. The user is then 20 asked to confirm the one or more parsed symptoms. If a symptom cannot be parsed, a form-based interface is presented to the user, with a prompt to select a symptom from a pick list. Pick lists are subdivided, based on symptom categories. Based on the one or more extracted symptoms, the user is lead through a series of yes-no dialogs to aid in determining one or more conditions 25 that may be causing the symptom.

Condition-inference engine 606 receives the yes-no answers from initial-symptom module 604 and develops a list of one or more potential conditions, ranked by probability or frequency. In the exemplary embodiment, the condition-inference engine uses rules stored in a database, rather than hard-coded 30 rules, to facilitate maintenance and automatic modification based on experience with users.

Condition-hyperlink generator 608 accepts output from the condition-inference engine, in the form of a list of medical conditions. For each condition,

generator 608 produces a short description of the condition and an HTML page of hyperlinks appropriate to the condition, including articles about the condition, potential treatments, effectiveness of treatments, side effects of treatments, prognosis, survival rates, specialists, support groups.

5 Followup dialog module 610 asks the user questions based on the username and case number. Questions are also based on data from the initial symptoms dialog and results from the condition-inference engine. Exemplary questions include whether the user visited a doctor, and if so, what diagnosis was given. In the exemplary embodiment, the followup dialog module includes a  
10 natural-language interface. However, in other embodiments, the followup dialog module includes a dynamically generated HTML form, with appropriate use of pick lists, radio buttons, checkboxes, and text-entry fields.

Knowledge-base feedback module 612 uses information gained in the followup dialog to enhance the knowledge base used in the condition-inference  
15 engine. In particular, diagnosis by doctors shall be used to enhance the probability ranking of conditions.

User-comment module 614 accepts comments from users about conditions, treatments, and side effects noted from followup dialog. These comments are extracted from the followup dialog, stored in a database, and made  
20 accessible to other users.

An exemplary operational scenario for system 600 proceeds as follows. A user logs into the system and registers as a first time user, filling out a form identifying her gender and date of birth. The system asks the user, "How can I help you today?" The user types, in natural language, "My wife and I are having  
25 trouble getting pregnant." The system replies, "I understand that you and your wife are having trouble conceiving. Is that correct?" The user replies, "Yes." The system asks, "Have you seen a doctor about your condition?" The user replies, "No." The system asks, "Have you been trying to get pregnant for more than one year?" User says, "Yes," and the system "Did you suffer from mumps  
30 after the age of 12?" User says, "No," and system asks "Are you physically unfit or on a weight reducing diet?" User says, "No." IMIS asks, "Do you have sex less than 3 times a week, on average?" User says, "Yes." System says, "Infrequent sex may be the cause of your condition," and adding "Here are other

leading causes of infertility for people your age: 1) Low-sperm count in the male; 2) Blocked fallopian tubes in the female; and 3) Chronic pelvic infection in female. Further, the system communicates that "it cannot perform a physical exam and cannot diagnose your condition. Only a doctor can diagnose your 5 condition. Would you like more information about these conditions?" User replies, "Yes."

In response, the system outputs or presents a hyperlinked page of condition descriptions, treatments for each condition, success rates for each treatment, specialists in infertility, and infertility support groups. At the top of 10 the page, the system communicates: "If you visit a doctor and are diagnosed, please come back for another visit."

Six months later, the user logs on to the system. The system recognizing the username and its associated casenumber, communicates: "Welcome back. Can I ask the status of your situation with infertility?" User replies, "Yes, my 15 wife and I are now pregnant." System says, "Congratulations! Did you visit a doctor to be diagnosed? User says, "Yes, the doctor performed tests on both me and my wife. No obvious problem was found; he recommended that we buy a basal thermometer and use it. After two months, we got pregnant." System says "Where did you buy your basal thermometer?" User says, "On the web, from 20 drugstore.com."

The system says, "Thank you for your input. I'll add your comments about basal thermometers to my database. Your input may help other couples that are having problems with fertility. Is there anything else I can help you with today?" User says, "No, that's all for now." The system says, "Thanks again for 25 your help. I'm going to e-mail you free coupons for baby formula and diapers. Visit me again if you need info about child care."

### Conclusion

In furtherance of the art, the inventor has presented systems, methods, and related software for encouraging and managing growth of databases, 30 particularly theme-oriented databases. One exemplary method entails establishing a health-oriented database and granting users access rights to the database based on their contributions or submissions to the database. The exemplary method scores the contributions for quality and/or relevance, granting

access rights based on the scores to contributors. Other embodiments record the queries of users of the database and facilitate communications between users having similar queries. Thus, the exemplary method and related systems and software facilitate not only organized growth of a theme-oriented database, but

5 also developing relationships between users of the database.

The embodiments described above are intended only to illustrate and teach one or more ways of practicing or implementing the present invention, not to restrict its breadth or scope. The actual scope of the invention, which embraces all ways of practicing or implementing the concepts of the invention, is

10 defined only by the following claims and their equivalents.

## CLAIMS

1. A method comprising exchanging access rights to a database for a data contribution to the database.  
5
2. The method of claim 1, wherein the access rights exchanged for the database are based on the quantity, quality, or relevance of the data contribution.
3. A system comprising means for exchanging respective access rights to a database for respective data contributions to the database.  
10
4. A method comprising:  
accepting one or more respective data contributions to a database from one or more respective users; and  
15 granting the one or more respective users access rights to the database based on quality or relevance of the respective data contributions.
5. A system comprising:  
means for accepting one or more respective data contributions to a database from one or more respective users; and  
20 means for granting the one or more respective users access rights to the database based on quality or relevance of the respective data contributions.
- 25 6. A system comprising:  
means for receiving one or more respective sets of information from one or more respective users, with each user having a respective username and a respective database-access rights;  
means for storing the one or more respective sets of information in a  
30 database;  
means for assigning at least one respective score to each of the respective sets of information; and

means for updating the respective database-access index for at least one user based on the score assigned to the respective set of information.

5 7. A method comprising:  
accepting two or more queries or contributions to a database from two or  
more respective users; and  
facilitating relationships between the users based on similarities of the  
queries or contributions.

10 8. A system comprising:  
means for accepting two or more queries or contributions to a database  
from two or more respective users; and  
means for facilitating relationships between the users based on  
similarities of the queries or contributions.

15 9. A method comprising:  
accepting one or more first queries or contributions to a database from  
one or more first users;  
accepting a second query or contribution to the database from a second  
user;  
identifying one or more of the first users based on similarities of the  
second query to one or more of the first queries or contributions;  
and

20 25 10. A system comprising:  
means for accepting one or more first queries or contributions to a  
database from one or more first users;  
means for accepting a second query or contribution to the database from  
a second user; and

means for identifying one or more of the first users based on similarities of the second query to one or more of the first queries or contributions; and

5 means for facilitating a relationship between the second user and the identified one or more first users.

11. A method comprising:

receiving one or more queries for a first database, with each query having an associated username;

10 storing the at least a portion of each of the queries in a second database, with each stored portion associated with the associated username; receiving a new query for the first database from a user computer; searching the second database based on at least a portion of the new query to identify one or more usernames; and

15 communicating an offer to access the identified one or more usernames to the user computer.

12. The methods or systems of claims 1-11, wherein the queries or contributions concern medical or health information.

20

13. The methods or systems of claims 1-11, wherein the queries or contributions concern knees, hearts, lungs, allergies, HIV, specific diseases, specific body parts, cancer, lost children, cooking, sports, entertainment, celebrities, politics, law, restaurants, consumer products, motion pictures, videos, 25 music recordings, corporations, government officials, criminal activity, schools, science, wines, beers, foods, professional service providers, colleges, alumni of educational institutions, genealogy, gossip, or sex.

30

14. A computer-readable medium comprising instructions for facilitating execution of the methods of claims 1, 2, 7, 9, 11, or 12.

15. A medical information system characterized by one or more of the following:
  - a user-registration and tracking module, an initial-symptom-and-medical-history-dialog module, a condition-inference engine, a condition-link generator; a followup-dialog module, a knowledge-base-feedback module, and a user-comments module.
16. A medical information system comprising:
  - means for receiving information regarding medical symptoms from at least one user;
  - means for inferring a medical condition from the medical symptoms;
  - means for receiving information regarding a medical diagnosis of the medical symptoms; and
  - means for adjusting the means for inferring the medical condition, based on the medical diagnosis.
16. A method of providing medical information to users, the method comprising:
  - receiving information regarding medical symptoms from at least one user;
  - inferring a medical condition from the medical symptoms using an inference engine;
  - receiving information regarding a medical diagnosis of the medical symptoms; and
  - adjusting operation of the inference engine based on the medical diagnosis.

1/6

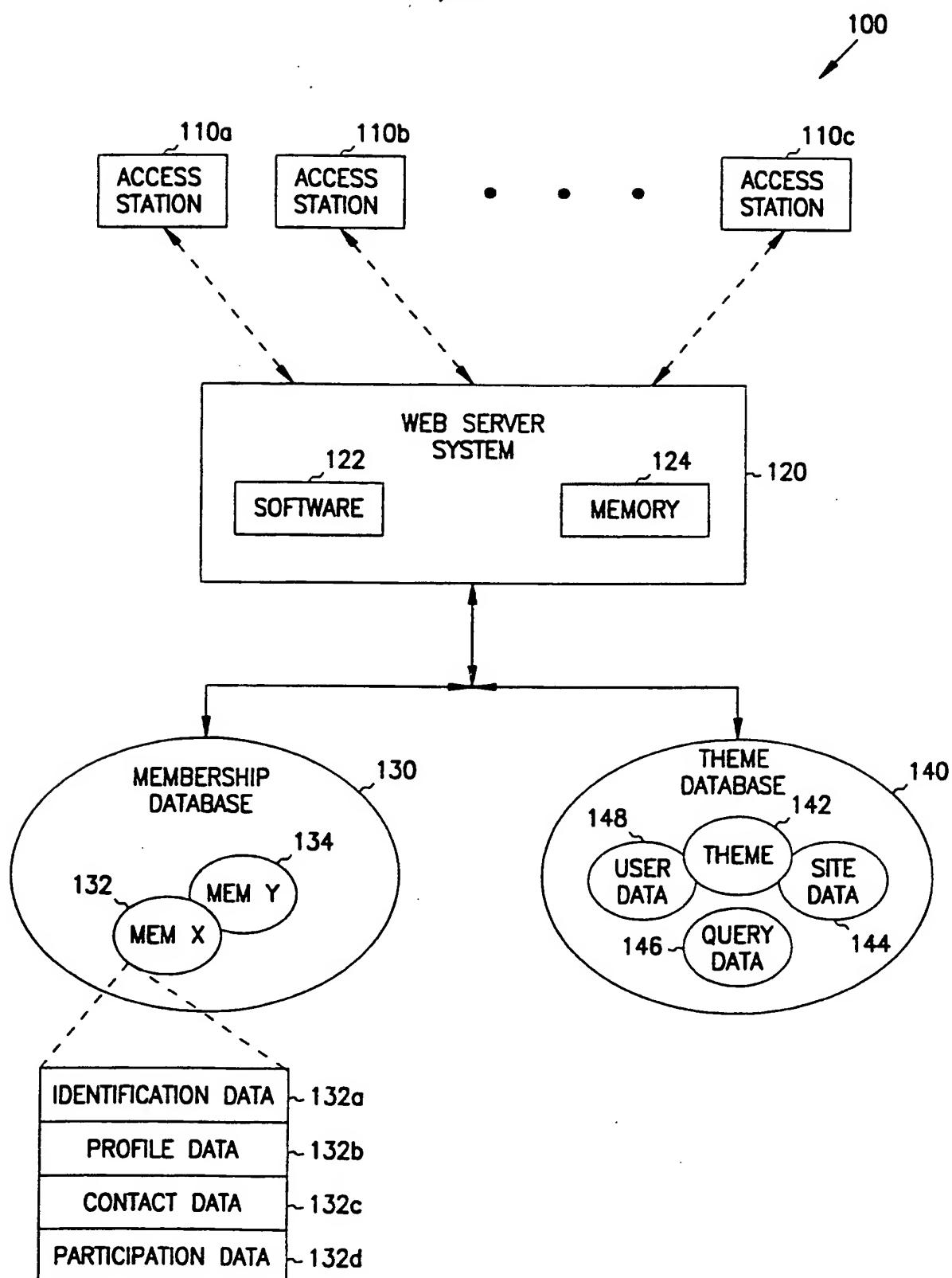


FIG. 1

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2/6

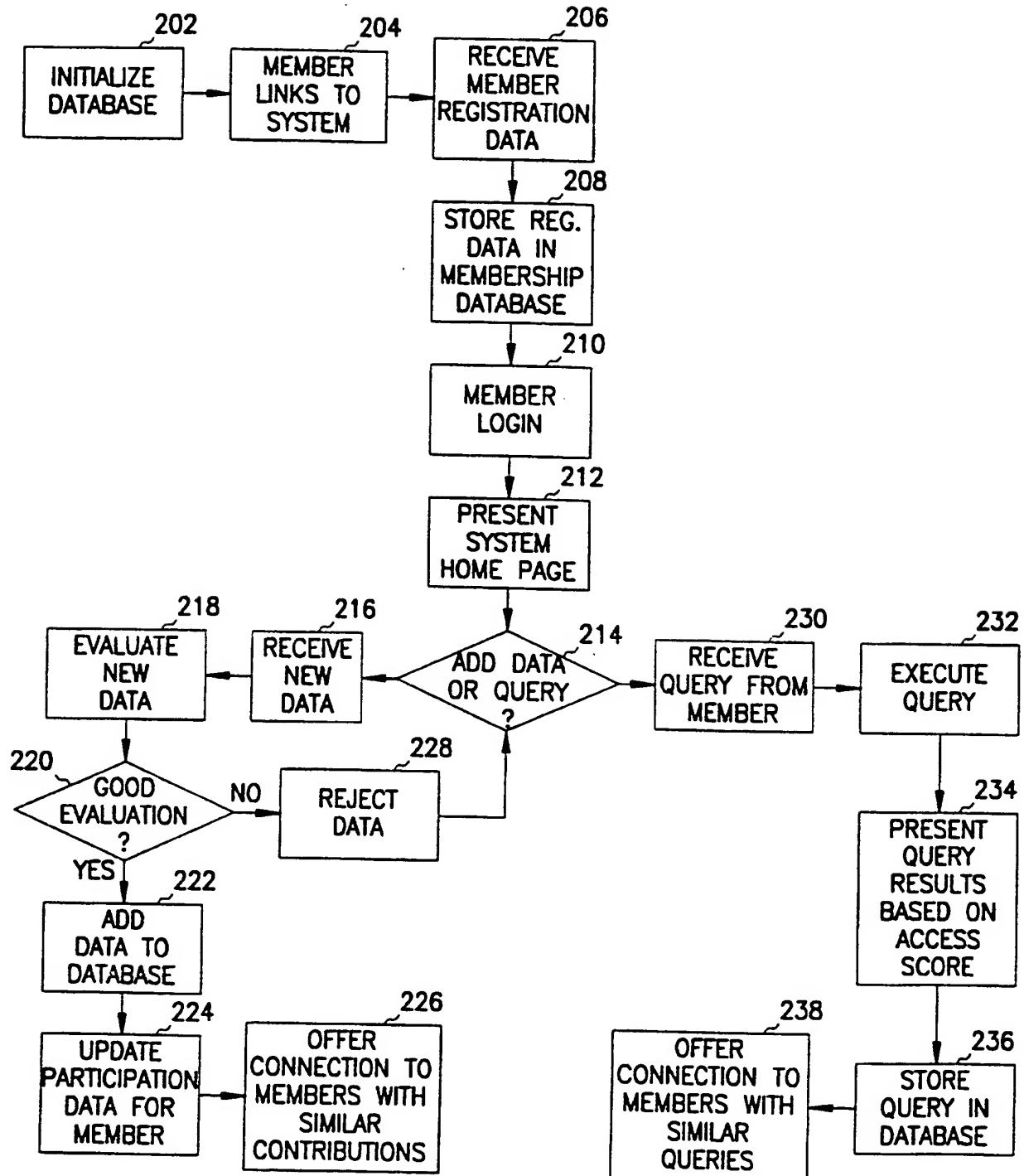


FIG. 2

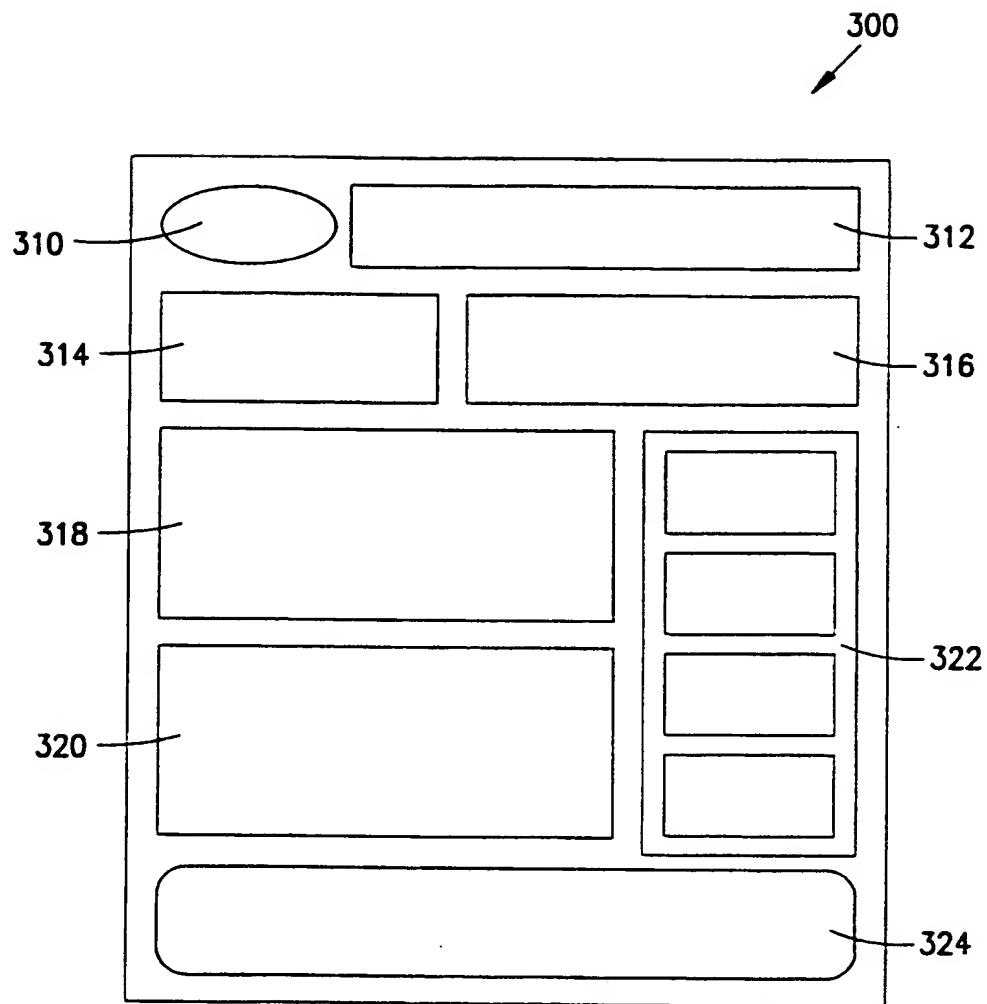


FIG. 3

400

ADD/ADHD	Cystic Fibrosis	Impotence	Pneumonia
AIDS/HIV	Dental Problems	Incontinence	Polio
Alcoholism	Depression	Intrable 80wer Syndrome	Pressure Ulcers
Allergies	Diabetes	Intestinal Obstruction	Prostate Cancer
Alzheimer's Disease	Diphtheria	Kidney Stones	Prostate Enlargement
Amyotrophic Lateral Sclerosis (ALS)	Diverticulitis	Knee Problems	Psoriasis
Angina	Earth Disorders	Liver Cirrhosis	Raynaud's
Anxiety Disorders	Encephalitis	Lupus	Phenomenon
Aphasia	Endometriosis	Lyme Disease	Rubella
Arterial Embolism	Epilepsy	Macular Degeneration	Schizophrenia
Arthritis	Fibromyalgia	Mania	Schizoaffective
Asthma	Flu	Depression/Mania	Sexually Transmitted Diseases
Ataxia-Telangiectasia (A-T)	Focal Segmental Glomerulosclerosis	Bladder	Shock
Autism	Fracture	Migraines	Stroke
Back Pain	Frostbite	Menopause	Subacute/Chronic Aging
Bell's Palsy	Gallstones	Multiple Sclerosis	Smoking
Breast Cancer	Gout	Mumps	Stroke
Cancer	Graucoma	Muscular Dystrophy	Stuttering
Carpal Tunnel Syndrome	Headaches	Myasthenia Gravis	Sudden Cardiac Arrest
Cataracts	Heart Disease	Narcolepsy	Tetanus (Lockjaw)
Cerebral Aneurysm	Heartburn/GERD	Obesity	Thyroid
Chickenpox	Hemorrhoids	Osteoporosis	Disease/Nodules
Chronic Fatigue Syndrome	Hepatitis, Acute	Other	Tuberculosis
Chronic Pain	Hepatitis, Chronic	Ovarian Cancer	Ulcers
Constipation	High Blood Pressure	Ovarian Cysts	Urinary Tract Infections
Crohn's disease	Huntington's Disease	Parkinson's Disease	Vaginitis
		Perfussis (Whooping Cough)	Yellino
			Yeast Infection

FIG. 4

500

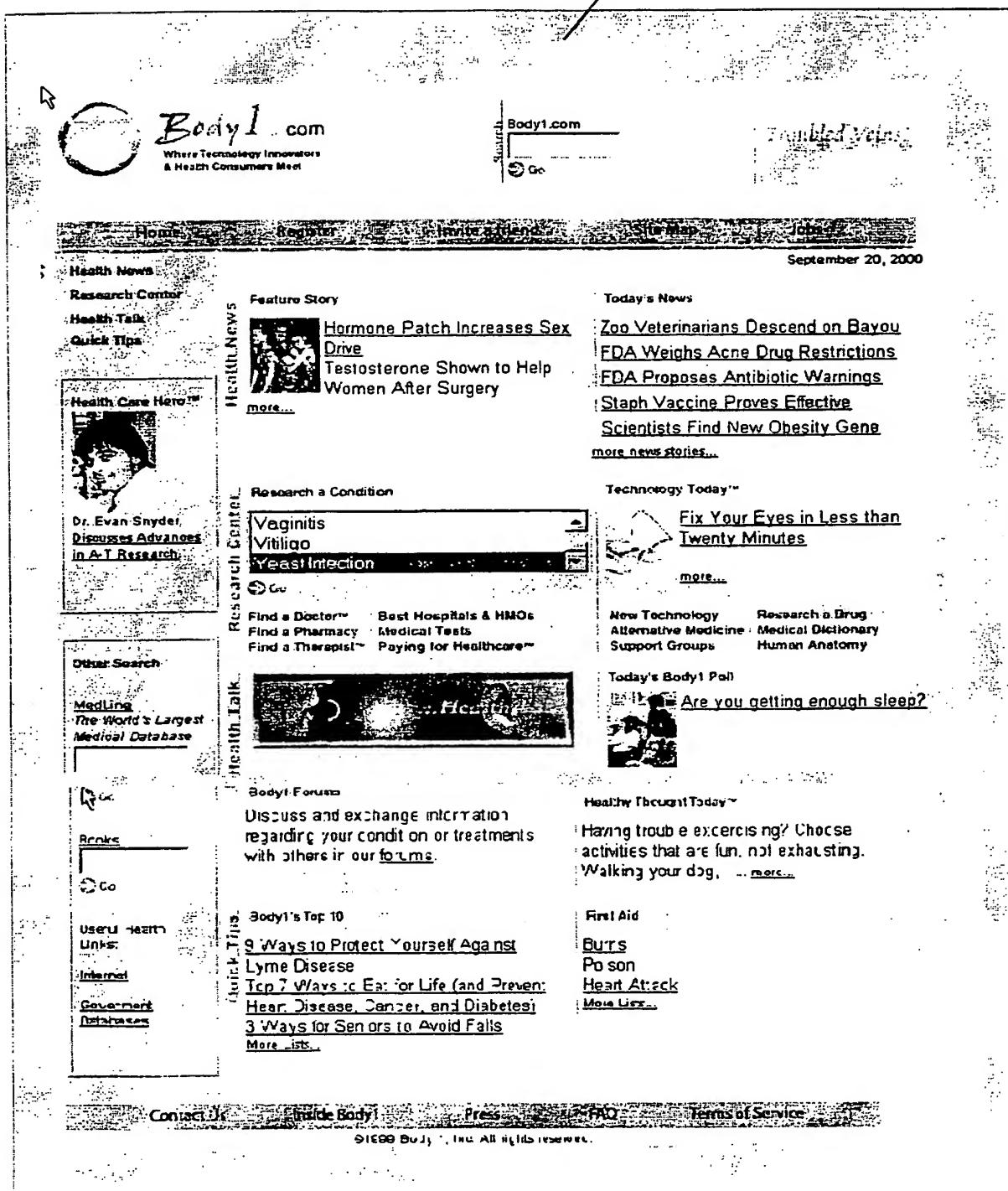


FIG. 5

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6/6

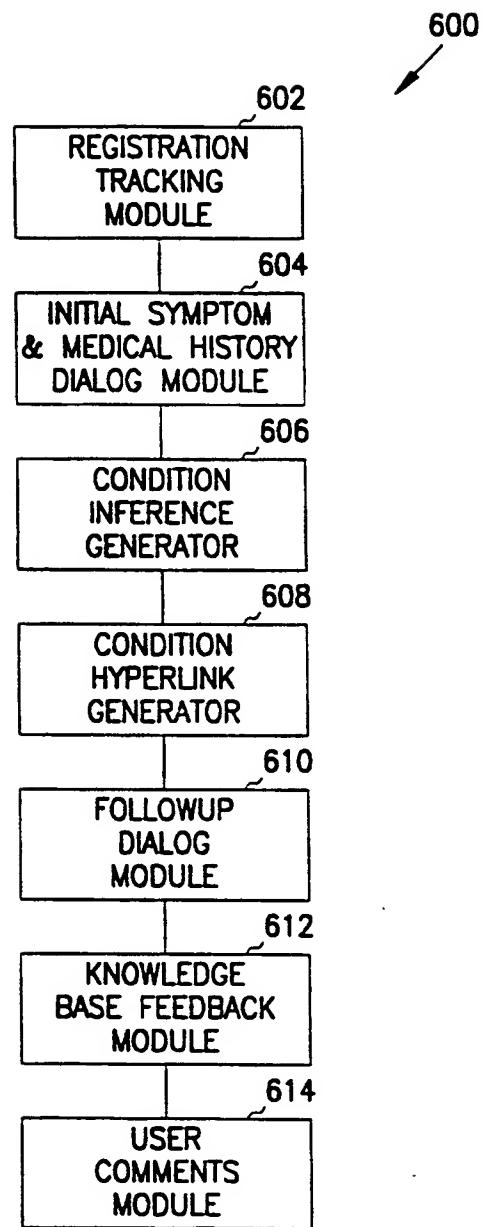


FIG. 6